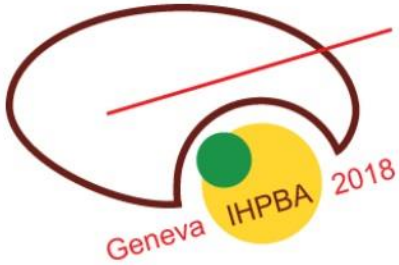

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Disclosure Statement of Financial Interest

I, Benjamin Peter Eigl DO NOT have a financial interest/arrangement or affiliation with one or more organisation which could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

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3D planning of irreversible electroporation treatment in pancreatic carcinoma: a use case

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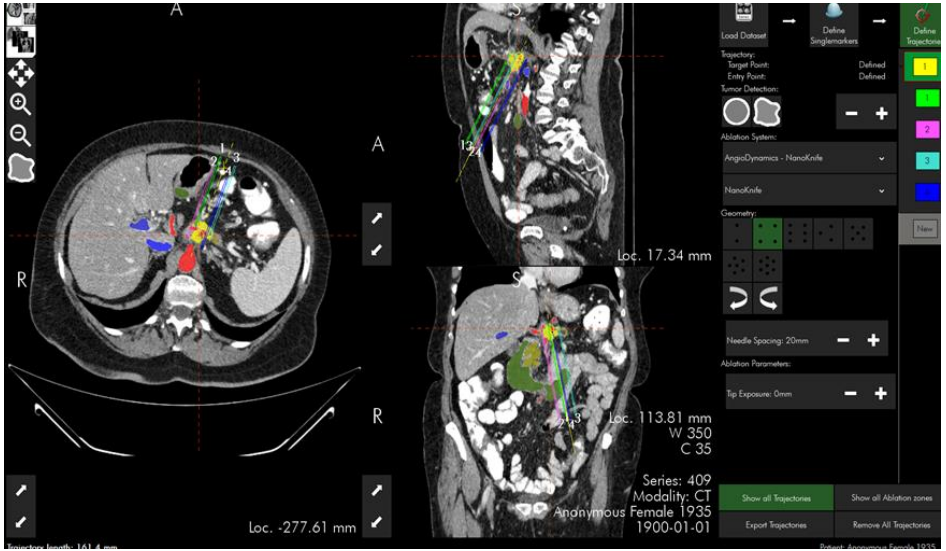
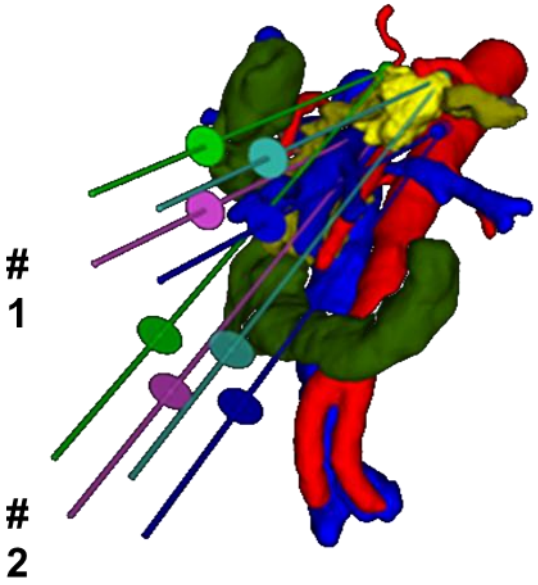
Objective

Irreversible-electroporation (IRE) is an ablation technique that spares vessels and is therefore suitable for treatment of locally advanced pancreatic cancer. Our surgery planning software supports pre-operative simulation of possible needle configurations in 3D to prepare for the ablation treatment. We present herein the application of the proposed software tool to one out of five cases which we already planned within a proof of concept study.



For planning of an open IRE treatment of a carcinoma of the pancreas, pre-operative CT image data was analyzed using a commercially available surgery planning tool. The resulting 3D anatomical reconstructions as well as the original CT data were loaded into our tablet-based software. The planning took place one day before the surgery at Inselspital, Bern.

Methods I



We then performed simulations of different IRE needle configurations and evaluated them with respect to vicinity to critical structures, while achieving the recommended needle spacing (20 mm) and parallelism which is essential for a successful IRE treatment.

Methods II

During the surgery the decision was to target according to plan #1 as the superior mesenteric vein was not mobilizable enough to obtain a window for the inferior right needle in the targeting plan #2. The number and placement of the needles relative to each other did not significantly depart from the pre-operatively defined plan.

Results

Conclusions

Our software provides surgeons the possibility to pre-operatively test and verify the feasibility of needle placement strategies. In addition, it enables a better understanding and orientation of the upcoming situs. Our next step is to enable intraoperative computer-assisted navigation to target according to the pre-operative plan.